Dec. 16, 1952 C. H. BELL 2,621,709

ADJUSTABLE THEATER CHAIR

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FIG. 1.

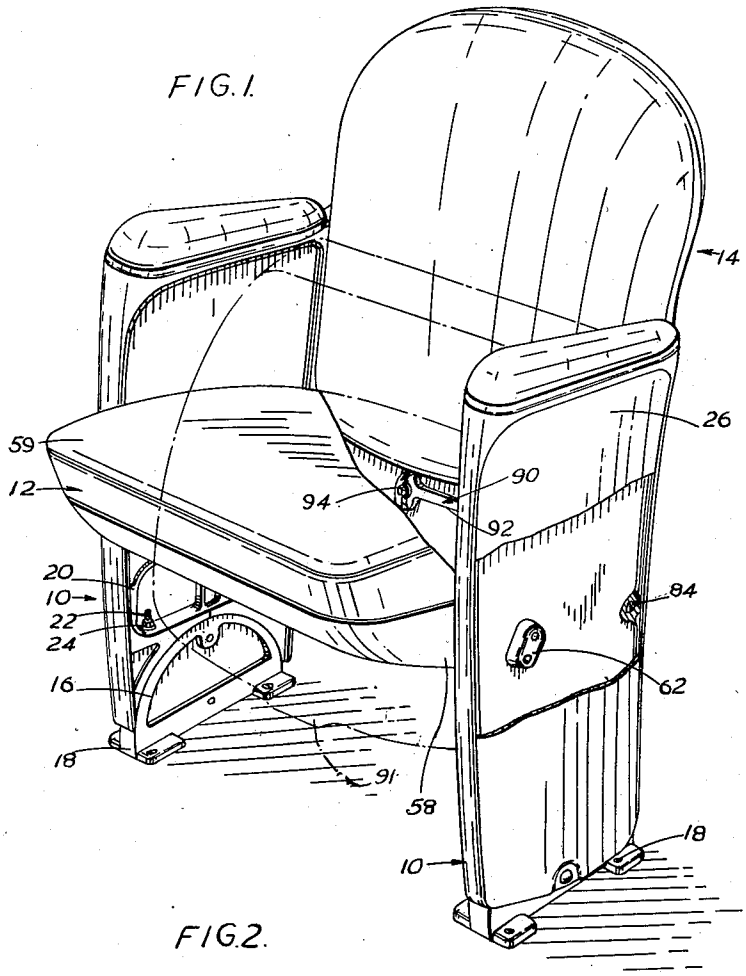
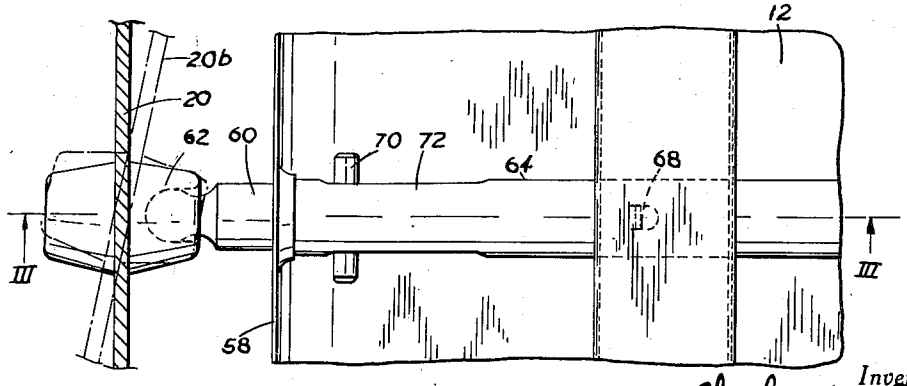


FIG. 2.



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FIG. 3.

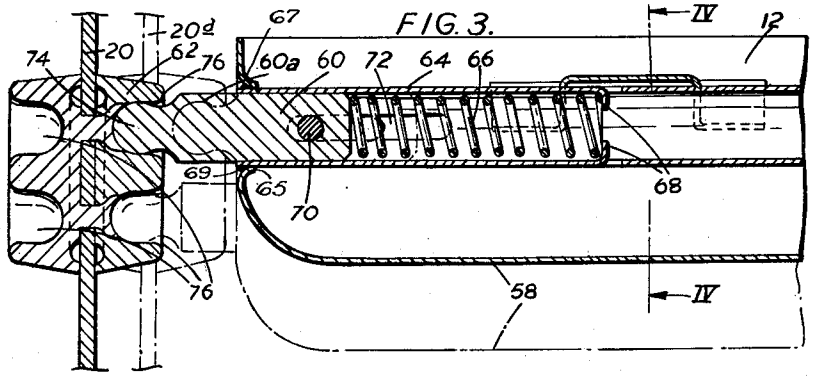


FIG. 4.

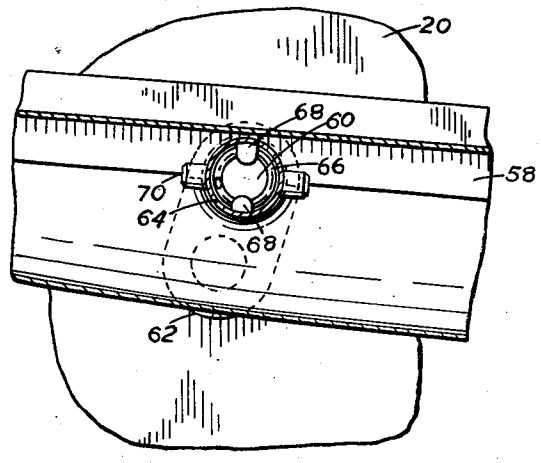
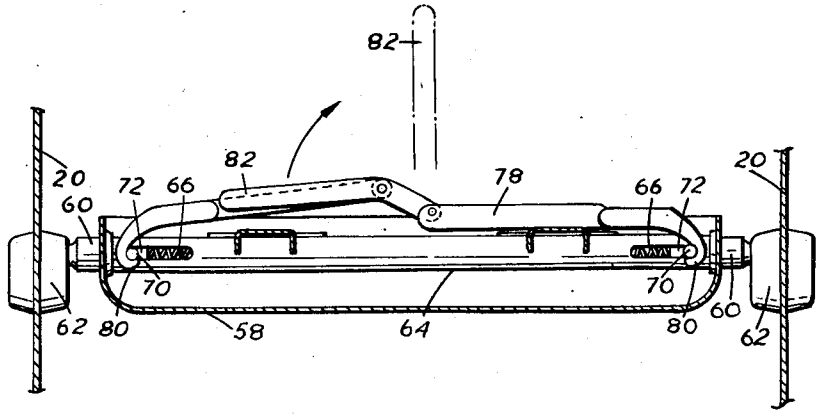


FIG. 5.



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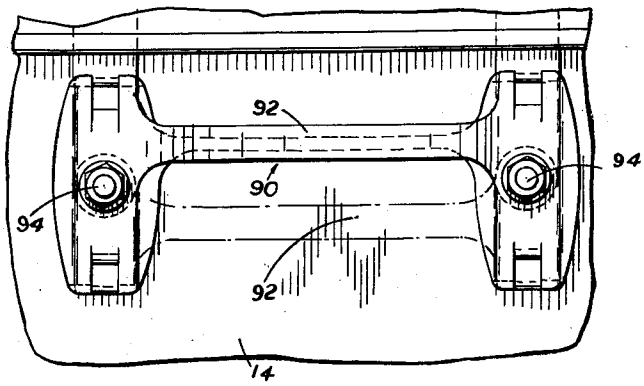
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FIG.6.



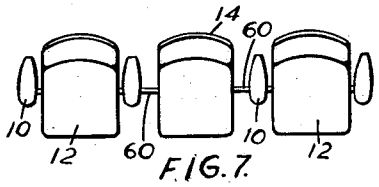


FIG.7.

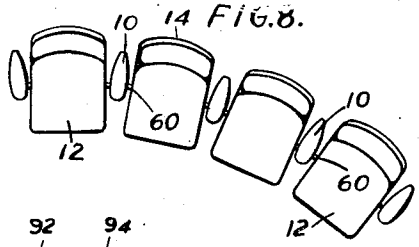
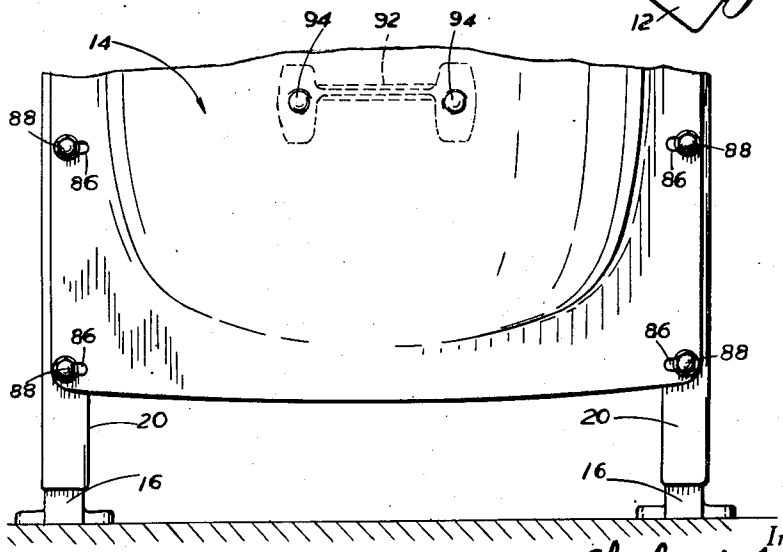


FIG.8.

FIG.9.



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ADJUSTABLE THEATER CHAIR

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Application April 30, 1948, Serial No. 24,282

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4 Claims. (Cl. 155—86)

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This invention relates to theatre chairs of the fixed kind, that is to say, chairs which are fixed to the floor in rows and consist of a seat supported between side standards. The side standards are usually castings which are provided on each side with a lug forming a bearing pin which engages in a corresponding female bearing provided on the underside of the seat.

When the chairs are to be mounted in position, one side standard is first fixed to the floor, a seat is engaged on the bearing pin and another standard is then brought up to the seat so that its bearing pin is engaged in the other seat bearing. This second standard is then fixed to the floor and the process is repeated until the end of the row is reached. To complete the mounting, backs are fixed to each pair of successive standards.

If, for any reason, a seat has to be removed, the process described above has to be reversed. Removal of a seat in the middle of a row involves dismantling all the chairs to one side of that to which the seat belongs.

The rows in which the chairs are arranged are frequently curved. This involves setting the side standards at an angle to each other and, for it to be possible for this to be done, the seat bearings must be provided with a substantial amount of play. This is a mechanically undesirable expedient.

It is also not unusual for successive rows to be of different lengths. The spacing of the standards is determined by the width of the seats and if, as is usual, it is desired, for the sake of appearance, that the ends of the rows be aligned, resort has to be had to the use, in at least some of the rows, of seats of odd widths.

The necessity of having to make seats of more than one width is very undesirable.

These disadvantages are avoided in accordance with the invention in a very simple manner by the provision of adjustable bearings, the seat being provided with a pair of stub shafts or the like which can be brought into and out of engagement with complementary bearing members on the side standards without disturbing the side standards.

The adjustment of the bearings can be and preferably is automatic, being ensured by a spring or springs which urge the bearing members on the seat outwards. The adjustment can, however, be non-automatic as by the provision of means for locking the seat bearing members in any adjusted position.

Preferably, the male bearing members are provided on the seat and the female on the side standards, the male member being in the form of a stub shaft having ball ends and the female members being in the form of hollow bosses.

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In the usual form of tip-up theatre seat, the seat is supported in the horizontal or seating position by means of lugs which project inwards from the side standards. In accordance with a further feature of the invention, the seat is supported on a stop or support formed on or carried by the back of the chair. The advantage of this is that the effectiveness of the supporting means is not dependent upon the separation or upon the relative orientation of the side standards.

In the preferred form of chair in accordance with the invention, the standards are provided with alternative bearing bosses at different heights and the seat supporting stop is arranged so that it can be set at different heights. Preferably, the supporting stop is made so that it can be set at a different height by simply removing it from the back and reversing it.

As the standards of a chair in accordance with the invention can be set at different distances apart, the back must be formed so that it can be fitted to the standards at different separations. This is most conveniently achieved by providing pin-and-slot connections between the standards and the back.

In order that the invention may be thoroughly understood and be more readily carried into effect, an example of a chair in accordance with it will now be described with reference to the accompanying drawings in which:

Figure 1 is a perspective view of the chair with certain parts shown cut away for the sake of clearness;

Figure 2 is a plan view to a larger scale taken from below showing the bearing between the seat of the chair and one of the side standards;

Figure 3 is a section taken on the line III—III in Figure 2;

Figure 4 is a section taken on the line IV—IV in Figure 3;

Figure 5 shows how a seat can be dismantled from the side standards without disturbing the latter;

Figure 6 shows a reversible seat stop;

Figures 7 and 8 are sketches showing different relative attitudes in which the side standards can be set; and

Figure 9 is a partial rear elevation of a chair.

The chair shown as a whole in Figure 1 has a pair of side standards 10 between which are

arranged a detachable tip-up seat 12 and a detachable back 14. The tops of the side standards serve as arm rests.

Each side standard is made up of two parts—a base part 16 which can be fixed to the floor by screws 18 and an upper part 20 which is held on the base part by bolts 22 having nuts 24.

A number of such side standards can be arranged in a row so that intermediate standards are common to two adjacent seats. In that case, the end standards can be provided with cover panels as shown at 26.

The seat 12 is made up of a pan 58 and a cushion 59. As shown in Figures 2–5, the pan 58 is provided with two male bearing members 60 in the form of stub shafts which engage in female bearing members 62 on the upper parts 20 of the side standards.

The stub shafts 60 are housed in a tube 64 and are urged outwards by springs 66. Abutments are provided for the springs by lugs 68 punched out of the tube 64. The outward movement of the stub shafts is limited by pins 70 passing through them and through slots 72 in the tube 64. The tube 64 passes through apertures 65 in the sides of the seat pan 58. The apertures are formed by piercing the pan sides and bending the edges 67 inwardly into the pan. The tube 64 is welded as at 69 to the edges 67.

The outer ends 74 of the stub shafts 60 are spherical and the bearing members 62 have complementarily shaped recesses 76.

With that arrangement, it is clear that a seat can be removed from its side standards without disturbing the latter. As the springs 66 will generally be rather strong, the removal of a seat is best effected by means of a tool 78 as shown in Figure 5. This tool has hooked ends 80 which can be engaged round the pins 70 when the seat cushion 59 is removed from the pan 58. It has a handle 82 which, when brought into the position shown in chain lines, pulls the pins closer together and brings the stub shafts 60 out of the bearing members 62 into the position 60*a* shown in Figure 3. The tool 78 has a toggle action so that it remains attached to the seat pan, allowing the pan to be removed with the tool still holding the stub shafts retracted. The same tool can be used for mounting the seat in position again by adopting the reverse procedure.

The spring loading of the stub shafts allows a good bearing to be obtained between the male and female bearing members without necessitating the setting of the standards at particular distances apart. Thus, the standard shown in Figure 3 could be set inwards, for example in the position 20*a*. A number of seats can, therefore be set in a row with successive pairs of standards at different distances apart as shown diagrammatically and exaggeratedly in Figure 7. As the separation of the standards can be varied within substantial limits, the length of a row of chairs can be adjusted without necessitating the use of seats of different widths.

The ball ends 74 and the complementary recess 76 allow a good bearing to be obtained without necessitating the setting of the standards at right angles to the axis of the stub shafts 60. Thus, the standard shown in Figure 2 could be set in the position 20*b*. This is very useful when, as is frequently the case, a curved row of chairs has to be set up as shown diagrammatically in Figure 8.

As the standards can be set at different distances apart, provision must be made for fixing the back of the chair to the standards whatever the setting of the latter may be. This is done by providing studs 84 (Fig. 1) which project from the upper part 20 of the standards and pass through horizontal slots 86 (Fig. 9) in the back 14. The separation of the standards can be varied within the limits imposed by the play between the studs and the ends of the slots. The back is held in position on the studs by cap nuts 88 (Fig. 9).

Means must be provided for maintaining the seat in the horizontal or sitting position shown in Figure 1. The normal means provided for this purpose are lugs which project inwards from the side standards and form stops against which parts of the seat are upwardly pressed by the weight of the user. Such means would not be very satisfactory if provided in the chair described above in which the standards can be set at different distances apart. It is preferred, therefore, to provide a single stop 90 on the back of the chair as shown in Figure 6, the disposition of the stop relatively to the seat being then independent of the spacing of the standards. A rearward extension 91, shown in Fig. 1 in chain lines, is formed on the back of the seat pan 12 to engage the underside of stop 90 on the chair back 14 when the seat is lowered into normal position shown in full lines in Fig. 1.

The chair shown in the drawings is also provided with means for adjusting the height of the seat. As shown in Figure 3, the bearing bosses 62 have two bearing recesses 76 in each side allowing the seat to be set at either one of two different heights as shown in chain lines in Figure 3. This involves making the seat stop 90 adjustable which is best done, as shown in Figure 6, by providing the stop with an offset crosspiece 92 which extends forwardly from the back to abut the back of the seat and is out of alignment with the axis of the studs 94 by which it is connected to the back of the chair. The height of the stop can then be altered by removing the stop and inverting it so that its crosspiece 94 takes up the position shown in chain lines in Fig. 6.

I claim:

1. A chair comprising a pair of side standards, a seat arranged between said side standards and pivotally supported by a pair of stub shafts extending outwardly from said seat towards said side standards, said stub shafts being slidably mounted in transverse openings in the sides of the seat, means to guide and limit the transverse movement of the stub shafts, female bearings carried by said standards to receive the outer ends of said stub shafts, resilient means urging said stub shafts outwards whereby to allow said side standards to be set within a range of different distances apart, said outer ends of said stub shafts being ball-ended and said female bearings being complementarily formed whereby to allow said side standards to be set out of parallelism with each other, a back, adjustable means for connecting said back to said side standards according to the relative disposition of said side standards and a stop carried by said back forming with said bearings a three-point support for said seat.

2. An arcuate row of theatre or like chairs, each chair comprising a pair of side standards common to adjacent chairs, a seat having its sides spaced from the standards and pivotally supported by a pair of aligned stub shafts slidably mounted in the seat in transverse openings in the sides of the seat, means to guide and limit

the transverse movement of the stub shafts towards and away from said standards, said stub shafts being ball ended at their outer ends, and said standards being provided with semi-spherical female bearings complementary to said ball ends to permit variation of said arcuate arrangement of said chairs in said row, means for resiliently urging said ball ends into engagement with said bearings, and a back carried by said side standards.

3. A chair as claimed in claim 2 in which said standards each carries a pair of female bearings at different heights to determine different heights for said seat, and in which said back carries a stop against which said seat abuts in the "sitting" position, and means adjustably securing the stop whereby the stop may be positioned in accordance with the pair of bearings in use.

4. A chair as claimed in claim 3 in which said stop is reversible on said back to determine different seat heights.

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